

11/14/86

SDMS DOCID # 1150071

7 500
50-500

August 1, 1986

solid < 50 non-hazardous
> 50 hazardous

~~DUP~~

REPORT
ADDITIONAL SITE INVESTIGATION
WALKER PROPERTIES SITE
SANTA FE SPRINGS, CALIFORNIA

DAMES & MOORE JOB NO. 13262-020-042
SANTA BARBARA, CALIFORNIA
NOVEMBER 14, 1986

Dames & Moore





November 14, 1986

Redevelopment Agency
City of Santa Fe Springs
11710 Telegraph Road
Santa Fe Springs, California 90670

Attention: Mr. Richard H. Weaver
Director, Redevelopment Agency

Subject: Report
Additional Site Investigation
Walker Properties Site
Santa Fe Springs, California

INTRODUCTION

Presented in this report are the results of our site investigation conducted at the Walker Properties site at 11020 Bloomfield Road, Santa Fe Springs, California. The general site area is shown in Figure 1. Dames & Moore has previously conducted several projects at the subject site (see our Subsurface Investigation Report, dated July 1, 1985; Draft Action Plan, dated November 27, 1985; and, Site Assessment Recommendations, dated October 16, 1986).

PURPOSE AND SCOPE

The purpose of the current investigation is to: (1) evaluate the vertical and lateral extent of contamination in the area surrounding the underground tank excavation and the two small above ground tank containment areas (Figure 2); and, (2) provide a technical report discussing the field and analytical results including options and associated cost estimates for removal and disposal of stained soils. Partial or non-removal options for site remediation were not a part of this investigation.

The scope of services for this investigation include: (1) installation of 32 test pits; (2) collection of 24 soil and waste samples; (3) analysis of 17 of the samples for California Administrative Manual (CAM) metals (using EPA-approved ICAP method), PCBs (using EPA Method 8080) and polynuclear aromatic hydrocarbons (using EPA Method 8310); and, (4) interpretation of the analytical results.

INVESTIGATIVE METHODS

The vertical and lateral extent of visually stained and/or odiferous soils in both the underground tank excavation and the two small above-ground tank areas (Figure 2) was investigated by excavating a series of backhoe pits. The pits were excavated using a 580D Case Extendahoe equipped with a two foot wide bucket to enable viewing of the penetrated material in the pit walls. The backhoe pits were excavated in two phases. Pits A through P were excavated on October 28, 1986 and Pits Q through GG were excavated on November 4, 1986.

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Twenty four soil samples were collected during the first phase of pit excavation for the purpose of chemical testing of selected samples. Samples were collected in wide-mouth sample jars. The sampled soil/waste material was packed tightly in the sample jars in order to reduce the amount of headspace in each sample. The sampling trowel was washed and rinsed in distilled water after collecting each sample. Appropriately labeled samples were sent under chain-of-custody documentation via overnight courier to California Analytical Laboratories in West Sacramento, California.

The thickness of stained soil in each pit was measured and is shown in Figure 3.

Analytical Testing Program

Seventeen¹⁷ of the soil samples were analyzed by California Analytical Laboratories (CAL) of West Sacramento, California. The samples were analyzed for metals using EPA-approved ICAP methodology and for PCBs using EPA Method 8080 which includes gas chromatography with electron capture detection (GC/ECD). In addition to metals and PCBs, two samples were also tested for polynuclear aromatic hydrocarbons (PNAs) using EPA Method 8310 which includes high performance liquid chromatography with ultra violet and fluorescence (HPLC UV and FLUOR). Quality control was maintained throughout laboratory analytical procedures. The CAL laboratory is State of California Department of Health Services-approved and EPA-accredited to perform these procedures.

INVESTIGATIVE RESULTS

The results of the laboratory analyses of the soil samples are presented in Table 1 and Appendix A. The analytical results indicate that the soils that are clean-appearing (samples 2, 11, 13, 19, 21, and 24) exhibit no detectable or minimal concentrations of PCBs, metals and PNAs. Of the stained looking samples (samples 1, 3, 5, 10, 12, 14, 16, 17, 18, 20, and 23), six exhibited elevated concentrations of contaminants, primarily PCBs, lead and copper. The remaining five stained soil samples (samples 3, 12, 23, 5, and 20) contained PCB concentrations ranging from not detected to 10 ppm and metals concentrations similar to those in the clean-appearing soil samples. Two of the stained soil samples (samples 1 and 14) contain concentrations of PCBs, lead and copper that exceed the TTLC* for these compounds. Thus, these samples are categorically defined as hazardous based on Section 66699(b) and (c) of Title 22. Samples 14, 15 and 17 exhibited elevated PCB concentrations. Although perhaps not clearly defined as hazardous under Section 66699 of Title 22, the remaining stained soil samples may be considered hazardous by CDHS on the basis of other statutory provisions. Samples 14 and 18 exhibited elevated barium concentrations. Sample 14 exhibited an elevated cadmium concentration.

* Total Threshold Limit Concentration as defined in California Administrative Code Title 22, Division 4, Chapter 30, Article 11, Section 66699.

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Samples 10, 12, 17, 18, and 23 exhibited elevated lead concentrations. Sample 14 exhibited an elevated zinc concentration. Both of the soil samples collected in the stockpiled soil (samples 20 and 21) exhibited elevated PCB and lead concentrations.

DISCUSSION

At the October 9, 1986 meeting attended by representatives of the City of Santa Fe Springs, Dames & Moore, the Los Angeles County Department of Health Services (LACDHS) and the Los Angeles County Public Works Department, the LACDHS representative suggested that soils contaminated with PCBs be cleaned up and removed if they contained a PCB concentration of more than 5 ppm. In addition, he indicated that any clean up level exceeding 5 ppm would have to be approved by the State of California Department of Health Services (CDHS). A large proportion (6 of the 11) of the stained soil samples exhibited PCB concentrations of greater than 5 ppm. However, not all of the stained soil samples exhibited PCB concentrations of more than 5 ppm. In light of these findings, several options are available to address the stained soil problem. Two such options include: (1) assuming all stained soils are a hazardous waste and thus excavate and dispose of them accordingly; or, (2) work with CDHS and other appropriate agencies to develop site specific criteria for soil removal and disposal. Each of these two options is discussed in the following paragraphs.

If the property owner wishes to assume that all of the stained soil is a hazardous waste, the volume of soil to be excavated and removed is estimated to be on the order of at least 4,000 to 6,000 cubic yards. Based on a cost of \$225 to \$300 per cubic yard for excavation, transportation, disposal and back-fill, the estimated cost for this action would be on the order of \$900,000 to \$1,800,000. The following assumptions were used to estimate the volume of stained soil and the associated removal and disposal costs:

- ° The volumes were calculated based on the thicknesses shown in Figure 3, with the thickness inside the 9 foot line assumed to be 9 feet, the thickness between the 6 and 9 foot lines assumed to be 7.5 feet, the thickness between the 1 and 3 foot lines assumed to be 1 foot and the soil pile assumed to be 4 feet high; and,
- ° The costs assume good weather, easy site access, no subsurface obstructions, utilities or pipes and use of a bulldozer and front end loader for excavation and truck loading, 20 cubic yard, licensed trucks for hauling and use of the Class I landfill at Kettleman Hills, California for disposal.

If the property owner wishes to pursue the second option, it is suggested that he enter into discussions with the appropriate regulatory agencies, such as the CDHS, to develop a strategy aimed at establishing criteria to allow stained soils to be segregated into hazardous waste and other than hazardous waste designated categories. In order to pursue this option, it is entirely possible that additional soil sampling and chemical testing for inorganic and organic

*No. if
the
removal
a case
will
be
to be approved
by the
state*

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compounds in the soil may be needed to better describe the precise distribution of contaminant concentrations. From this type of information it may be possible to segregate the stained soils into the categories mentioned above. It is not possible, at this time, to provide a cost estimate for this option. It is likely, however, that excavation and backfill costs would be the same as under the first option provided the same amount of soil is removed. However, the costs for transportation and disposal of removed soil may be reduced.

Finally, we point out that there may be other options available which the property owner may wish to pursue with the regulatory agencies.

If you have any questions regarding this report, please contact us. We look forward to assisting you on future projects.

Very truly yours,

DAMES & MOORE

Thomas A. Vinckier

Thomas A. Vinckier
Associate

Gerald A. Hels

Gerald A. Hels
Project Engineer

TABLE 1
SOIL SAMPLES ANALYTICAL RESULTS SUMMARY (1)

CONSTITUENT	SAMPLE AND CONCENTRATION (PPM) (2)																
	1	2	3 (3)	10	11	12	13	14	16 (3)	17	18	19	23	24	25	20	21
PCBs																	
Aroclor-1242	200	0.27	<0.1 (4)	3.1	<0.1	4.3	2.3	30	13	15	1.7	<0.1	ND (5)	ND	ND	ND	ND
Aroclor-1260	ND	ND	ND	3.3	ND	ND	ND	ND	ND	ND	1.8	ND	0.6	0.11	ND	ND	ND
Aroclor-1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.4	10	11
CAM Metals																	
Barium	127	216	118	256	164	164	178	1260	158	126	760	131	88	84	127	68	180
Beryllium	<0.5	0.82	<0.5	<0.5	0.59	0.58	0.64	1.1	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.53
Cadmium	<0.5	<0.5	<0.5	0.71	<0.5	0.71	<0.5	35	<0.5	0.86	0.97	<0.5	<0.5	<0.5	<0.5	0.58	<0.5
Chromium (total)	21	33	17	22	25	28	31	119	26	21	24	22	9.3	10	18	9.7	27
Cobalt	9.9	15	7.6	8.1	12	11	13	8.4	12	5.8	8.4	10	3.4	4.9	9.0	3.9	11
Copper	20	30	16	46	23	29	26	5140	29	191	36	26	30	14	20	13	28
Lead	9.1	15	7.6	438	10	220	12	2470	17	276	450	15	120	21	8.1	48	138
Mercury	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	<0.1	<0.1	0.13	<0.1	0.38	<0.1	<0.1	<0.1	<0.1
Molybdenum	<10	<10	<10	<10	<10	<10	<10	73	<10	<10	<10	<10	<10	<10	<10	<10	<10
Nickel	16	24	13	14	20	19	24	69	20	16	17	16	8.5	9.4	16	9.9	21
Silver	<2	<2	<2	<2	<2	<2	<2	14	<2	<2	2.2	<2	<2	<2	<2	<2	<2
Vanadium	37	63	32	30	46	46	48	20	47	17	30	38	13	19	33	18	45
Zinc	43	58	34	91	50	155	56	1370	53	122	140	47	84	68	46	184	105
PNAs (3)																	
Naphthalene			ND						2.2								
Fluorene			ND						1.4								
Phenanthrene			0.035						4.5								
Anthracene			ND						0.24								
Fluoranthene			ND						1.2								
Pyrene			ND						1.5								
Benzo(a)pyrene			ND						0.53								

- (1) Only those constituents detected in at least one of the samples are shown herein. Soil sample locations are shown on Figure 2.
- (2) PPM = Parts Per Million
- (3) Only samples 3 and 16 were analyzed for PNAs.
- (4) The less than (<) symbol means "not present at or above the indicated value (detection limit)."
- (5) The ND means not detected.



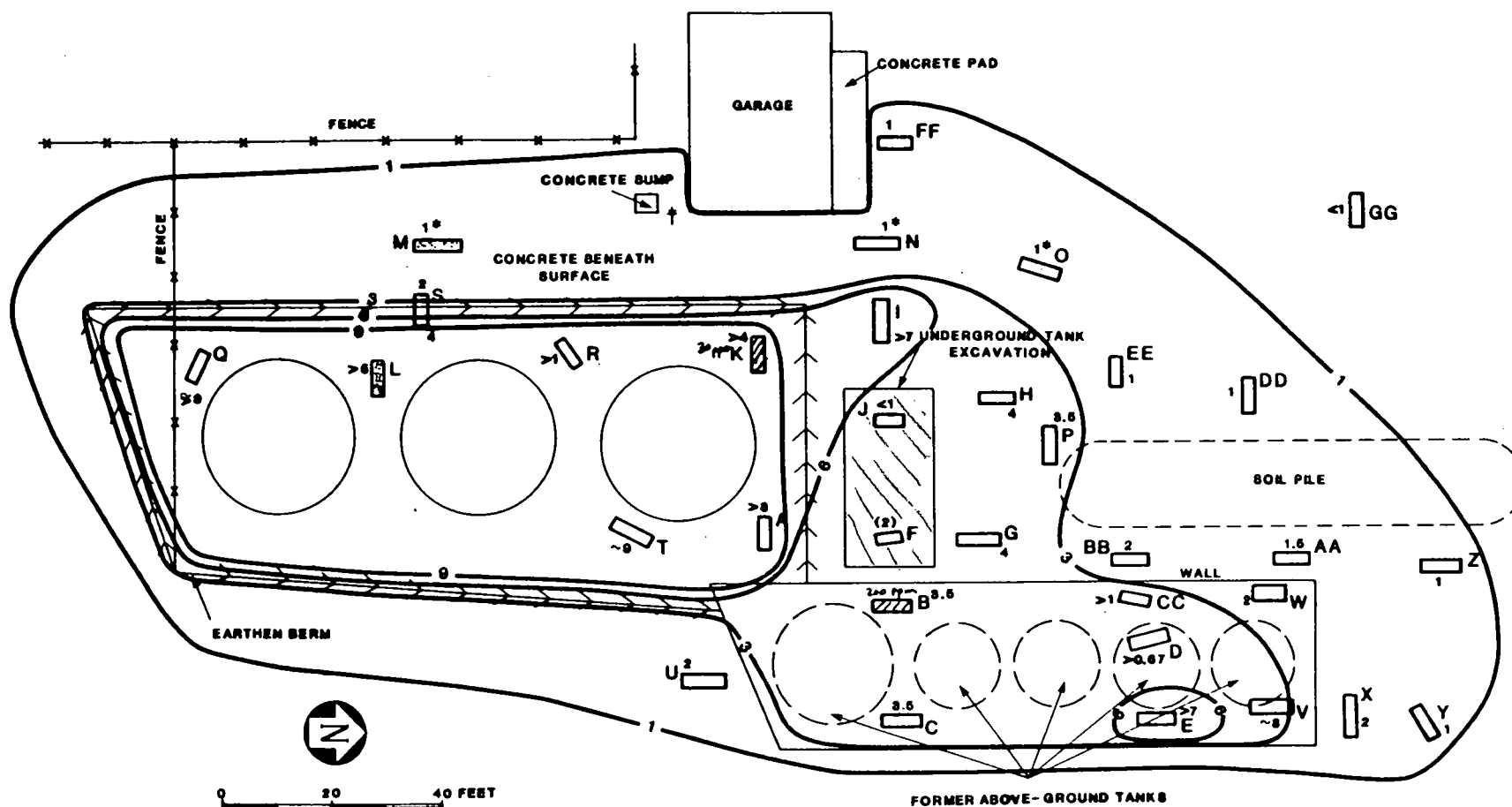
TRENCH AND SOIL SAMPLE LOCATION MAP

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FIGURE 1
WALKER PROPERTIES SITE
(1958 AERIAL PHOTOGRAPH)





EXPLANATION:





-  TEST PIT LOCATION AND STAINED SOIL THICKNESS IN FEET
-  STAINED SOIL THICKNESS CONTOUR IN FEET
-  CONCRETE AT A DEPTH OF APPROXIMATELY 1 FOOT
-  DEPTH AND NATURE OF CONTAMINATION IF ANY, BENEATH BUMP IS NOT KNOWN

FIGURE 3

STAINED SOIL THICKNESS MAP

Dames & Moore

APPENDIX A
ANALYTICAL LABORATORY RESULTS

California Analytical Laboratories

2544 Industrial Boulevard ♦ West Sacramento, CA 95691 ♦ (916) 372-1393

A DIVISION OF
ENSECO
INCORPORATED

October 31, 1986
Lab No. 26673
Received: 10/25/86
Project: 13262-020-042

Jerry Hels
Dames & Moore
812 Anacapa Street
Suite A
Santa Barbara, CA 93101

Twenty-four soil samples were received under chain of custody in CAL Labs eight ounce glass jars to be analyzed for CAM (TTLIC) metals, PCB's and polyaromatic hydrocarbons (EPA 8310).

CAL I.D.	Sample I.D.	
26673-1	TB 1-D-1	10/24/86 1040
-2	TB 2-C-3.5	10/24/86 1040
-3	TC 3-D-1	10/24/86 1050
-4	TC 4-C-4	10/24/86 1050
-5 ✓ 26748-1	TE 5-D-7	10/24/86 1100
-6	TF 6-D-1	10/24/86 1130
-7	TF 7-C-2.5	10/24/86 1130
-8	TG 8-D-2	10/24/86 1145
-9	TG 9-C-4.5	10/24/86 1145
-10	TH 10-D-2	10/24/86 1315
-11	TH 11-C-4	10/24/86 1320
-12	TI 12-D-4	10/24/86 1335
-13	TJ 13-C-1	10/24/86 1355
-14	TK 14-D-1	10/24/86 1400
-15	TL 15-D-1	10/24/86 1415
-16	TL 16-D-5	10/24/86 1420
-17	TM 17-D-6	10/24/86 1430
-18	TP 18-D-1	10/24/86 1430
-19 ✓ 26748-2	TP 19-C-4	10/24/86 1430
-20	SP 20-D-0	10/24/86 1500
-21 ✓ 26748-3	SP 21-C-0	10/24/86 1500
-22	TA 22-D-1	10/24/86 1515
-23	SURF 23-D-1"	10/24/86 1530
-24	SURF 24-C-6"	10/24/86 1530

RESULTS

Results for EPA method 8310 and CAM (TTLIC) metals are on the attached data sheets. PCB results are in Table I.



Ben N. Buechler
Director of
Chromatography Services

jb

This report is for the sole and exclusive use of the client to whom it is addressed.
Samples not destroyed in testing are retained a maximum of thirty (30) days unless otherwise requested.

Table I

CAL I.D.	ug/Kg (ppb) PCB found
26673-1	200000 (Aroclor 1242)
-2	270 (Aroclor 1242)
-3	<100
-10	3100 (Aroclor 1242) 3300 (Aroclor 1260)
-11	<100
-12	430 (Aroclor 1242)
-13	230 (Aroclor 1242)
-14	30000 (Aroclor 1242)
-16	13000 (Aroclor (1242)
-17	15000 (Aroclor 1242)
-18	1700 (Aroclor 1242) 1800(Aroclor 1260)
-19	<100
-23	600 (Aroclor 1260)
-24	110 (Aroclor 1260)

APPROVED BY

BMB

POLYAROMATIC HYDROCARBONS
EPA Method 8310
Data Sheet

Sample I.D. Method Blank

CAL I.D. 26673-MB

Method Select Limit

	<u>ug/Kg (ppb)</u>
naphthalene	<u><100</u>
acenaphthylene	<u><100</u>
acenaphthene	<u><200</u>
fluorene	<u><20</u>
phenanthrene	<u><8</u>
anthracene	<u><4</u>
fluoranthene	<u><10</u>
pyrene	<u><20</u>
benzo(a)anthracene	<u><10</u>
chrysene	<u><10</u>
benzo(b)fluoranthene	<u><5</u>
benzo(k)fluoranthene	<u><5</u>
benzo(a)pyrene	<u><10</u>
dibenzo(a,h)anthracene	<u><40</u>
benzo(g,h,i)perylene	<u><20</u>
indeno(1,2,3-cd)pyrene	<u><10</u>

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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[Signature]

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[Signature]

POLYAROMATIC HYDROCARBONS
EPA Method 8310
Data Sheet

Sample I.D. TC 3-D-1 10/24/86 1050

CAL I.D. 26673-3

	<u>ug/Kg (ppb)</u>
naphthalene	<u><100</u>
acenaphthylene	<u><100</u>
acenaphthene	<u><200</u>
fluorene	<u><20</u>
phenanthrene	<u>35</u>
anthracene	<u><4</u>
fluoranthene	<u><10</u>
pyrene	<u><20</u>
benzo(a)anthracene	<u><20</u>
chrysene	<u><100</u>
benzo(b)fluoranthene	<u><5</u>
benzo(k)fluoranthene	<u><5</u>
benzo(a)pyrene	<u><10</u>
dibenzo(a,h)anthracene	<u><40</u>
benzo(g,h,i)perylene	<u><20</u>
indeno(1,2,3-cd)pyrene	<u><10</u>

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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JB

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JS

POLYAROMATIC HYDROCARBONS
EPA Method 8310
Data Sheet

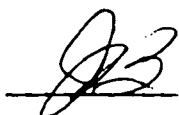
Sample I.D. TL 16-D-5 10/24/86 1420

CAL I.D. 26673-16

	<u>ug/Kg (ppb)</u>
naphthalene	<u>2200</u>
acenaphthylene	<u><1000</u>
acenaphthene	<u><2000</u>
fluorene	<u>1400</u>
phenanthrene	<u>4500</u>
anthracene	<u>240</u>
fluoranthene	<u>1200</u>
pyrene	<u>1500</u>
benzo(a)anthracene	<u><200</u>
chrysene	<u><10000</u>
benzo(b)fluoranthene	<u><500</u>
benzo(k)fluoranthene	<u><500</u>
benzo(a)pyrene	<u>530</u>
dibenzo(a,h)anthracene	<u><400</u>
benzo(g,h,i)perylene	<u><2000</u>
indeno(1,2,3-cd)pyrene	<u><1000</u>

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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APPROVED BY



C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TB 1-D-1 10-24-86 1040

CAL ID: 26673-1

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	127	100	XXX
Beryllium	75	<0.5	0.75	XXX
Cadmium	100	<0.5	1	XXX
*Chromium III/VI	2500/500	21	560/5	XXX
Cobalt	8000	9.9	80	XXX
Copper	2500	20	25	XXX
Lead	1000	9.1	5	XXX
Mercury	20	<0.10	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	16	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	37	24	XXX
Zinc	5000	43	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TB 2-C-3.5 10-24-86 1040

CAL ID: 26673-2

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	216	100	XXX
Beryllium	75	0.82	0.75	XXX
Cadmium	100	<0.5	1	XXX
*Chromium III/VI	2500/500	33	560/5	XXX
Cobalt	8000	15	80	XXX
Copper	2500	30	25	XXX
Lead	1000	15	5	XXX
Mercury	20	<0.10	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	24	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	63	24	XXX
Zinc	5000	58	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

PREPARED BY Cs

APPROVED BY mIL

C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TC 3-D-1 10-24-86 1050

CAL ID: 26673-3

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	118	100	XXX
Beryllium	75	<0.5	0.75	XXX
Cadmium	100	<0.5	1	XXX
*Chromium III/VI	2500/500	17	560/5	XXX
Cobalt	8000	7.6	80	XXX
Copper	2500	16	25	XXX
Lead	1000	7.6	5	XXX
Mercury	20	<0.10	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	13	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	32	24	XXX
Zinc	5000	34	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TH 10-D-2 10-24-86 1315

CAL ID: 26673-10

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	256	100	XXX
Beryllium	75	<0.5	0.75	XXX
Cadmium	100	0.71	1	XXX
*Chromium III/VI	2500/500	22	560/5	XXX
Cobalt	8000	8.1	80	XXX
Copper	2500	46	25	XXX
Lead	1000	438 ✓	5	XXX
Mercury	20	<0.10	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	14	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	30	24	XXX
Zinc	5000	91	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TH 11-C-4 10-24-86 1320

CAL ID: 22673-11

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	164	100	XXX
Beryllium	75	0.59	0.75	XXX
Cadmium	100	<0.5	1	XXX
*Chromium III/VI	2500/500	25	560/5	XXX
Cobalt	8000	12	80	XXX
Copper	2500	23	25	XXX
Lead	1000	10	5	XXX
Mercury	20	<0.10	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	20	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	46	24	XXX
Zinc	5000	50	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

PREPARED BY CS

APPROVED BY mJL

C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TI 12-D-4 10-24-86 1335

CAL ID: 26673-12

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	164	100	XXX
Beryllium	75	0.58	0.75	XXX
Cadmium	100	0.71	1	XXX
*Chromium III/VI	2500/500	28	560/5	XXX
Cobalt	8000	11	80	XXX
Copper	2500	29	25	XXX
Lead	1000	220	5	XXX
Mercury	20	<0.10	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	19	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	46	24	XXX
Zinc	5000	155	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

PREPARED BY CS

APPROVED BY MIJL

C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TJ 13-C-1 10-24-86 1355

CAL ID: 26673-13

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	178	100	XXX
Beryllium	75	0.64	0.75	XXX
Cadmium	100	<0.5	1	XXX
*Chromium III/VI	2500/500	31	560/5	XXX
Cobalt	8000	13	80	XXX
Copper	2500	26	25	XXX
Lead	1000	12	5	XXX
Mercury	20	<0.10	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	24	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	48	24	XXX
Zinc	5000	56	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

PREPARED BY CS

APPROVED BY mJL

C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TK 14-D-1 10-24-86 1400

CAL ID: 26673-14

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	1260	100	XXX
Beryllium	75	1.1	0.75	XXX
Cadmium	100	35	1	XXX
*Chromium III/VI	2500/500	119 ✓	560/5	XXX
Cobalt	8000	8.4	80	XXX
Copper	2500	5140 ✓	25	XXX
Lead	1000	2470 ✓	5	XXX
Mercury	20	0.50	0.2	XXX
Molybdenum	3500	73	350	XXX
Nickel	2000	69	20	XXX
Selenium	100	<5	1	XXX
Silver	500	14	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	20	24	XXX
Zinc	5000	1370	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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APPROVED BY mjl

C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TL 16-D-5 10-24-86 1420

CAL ID: 26673-16

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	158	100	XXX
Beryllium	75	0.60	0.75	XXX
Cadmium	100	<0.5	1	XXX
*Chromium III/VI	2500/500	26	560/5	XXX
Cobalt	8000	12	80	XXX
Copper	2500	29	25	XXX
Lead	1000	17	5	XXX
Mercury	20	<0.10	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	20	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	47	24	XXX
Zinc	5000	53	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TM 17-D-6 10-24-86 1430

CAL ID: 26673-17

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	126	100	XXX
Beryllium	75	<0.5	0.75	XXX
Cadmium	100	0.86	1	XXX
*Chromium III/VI	2500/500	21	560/5	XXX
Cobalt	8000	5.8	80	XXX
Copper	2500	191	25	XXX
Lead	1000	276 ✓	5	XXX
Mercury	20	<0.10	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	16	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	17	24	XXX
Zinc	5000	122	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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APPROVED BY MTL

C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TP 18-D-1 10-24-86 1430

CAL ID: 26673-18

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	760	100	XXX
Beryllium	75	<0.5	0.75	XXX
Cadmium	100	0.97	1	XXX
*Chromium III/VI	2500/500	24	560/5	XXX
Cobalt	8000	8.4	80	XXX
Copper	2500	36	25	XXX
Lead	1000	450 ✓	5	XXX
Mercury	20	0.13	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	17	20	XXX
Selenium	100	<5	1	XXX
Silver	500	2.2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	30	24	XXX
Zinc	5000	140	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TP 19-C-4 10-24-86 1430

CAL ID: 26673-19

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	131	100	XXX
Beryllium	75	<0.5	0.75	XXX
Cadmium	100	<0.5	1	XXX
*Chromium III/VI	2500/500	22	560/5	XXX
Cobalt	8000	10	80	XXX
Copper	2500	26	25	XXX
Lead	1000	15	5	XXX
Mercury	20	<0.10	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	16	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	38	24	XXX
Zinc	5000	47	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: SURF 23-D-1" 10-24-86 1530

CAL ID: 26673-23

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	88	100	XXX
Beryllium	75	<0.5	0.75	XXX
Cadmium	100	<0.5	1	XXX
*Chromium III/VI	2500/500	9.3	560/5	XXX
Cobalt	8000	3.4	80	XXX
Copper	2500	30	25	XXX
Lead	1000	120	5	XXX
Mercury	20	0.38	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	8.5	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	13	24	XXX
Zinc	5000	84	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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CS

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m J L

C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: SURF 24-C-6" 10-24-86 1530

CAL ID: 26673-24

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	XXX
Antimony	500	<40	15	XXX
Barium	10000	84	100	XXX
Beryllium	75	<0.5	0.75	XXX
Cadmium	100	<0.5	1	XXX
*Chromium III/VI	2500/500	10	560/5	XXX
Cobalt	8000	4.9	80	XXX
Copper	2500	14	25	XXX
Lead	1000	21	5	XXX
Mercury	20	<0.10	0.2	XXX
Molybdenum	3500	<10	350	XXX
Nickel	2000	9.4	20	XXX
Selenium	100	<5	1	XXX
Silver	500	<2	5	XXX
Thallium	700	<50	7	XXX
Vanadium	2400	19	24	XXX
Zinc	5000	68	250	XXX

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

PREPARED BY Cs

APPROVED BY mJZ

California Analytical Laboratories

2544 Industrial Boulevard ♦ West Sacramento, CA 95691 ♦ (916) 372-1393

A DIVISION OF
ENSECO
INCORPORATED

November 5, 1986
Lab No. 26748
Received: 10/30/86
Project: 13262-020-042

Jerry Hels
Dames & Moore
812 Anacapa Street, Suite A
Santa Barbara, CA 93101

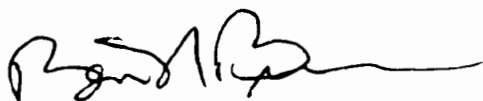
Three soil samples received in eight ounce glass jars were resubmitted to be analyzed for CAM (TTLIC) metals and PCB's.

<u>CAL I.D.</u>	<u>Sample I.D.</u>	<u>OLD CAL I.D.</u>
26748-1	TE 5-D-7	26673-5
-2	SP 20-D-0	-20
-3	SP 21-C-0	-21

RESULTS

Results for CAM (TTLIC) metals are on the attached data sheets. PCB analysis by dual column GC-EC indicated the following:

<u>CAL I.D.</u>	<u>ug/Kg (ppb)</u> <u>PCB's</u>
26748-1	3400 (Aroclor 1248)
-2	10000 (Aroclor 1248)
-3	11000 (Aroclor 1248)



Ben N. Buechler
Director of
Chromatography Services

jb

C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: TE 5-D-7

CAL ID: 26748-1

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	xxx
Antimony	500	<40	15	xxx
Barium	10000	127	100	xxx
Beryllium	75	<0.5	0.75	xxx
Cadmium	100	<0.5	1	xxx
*Chromium III/VI	2500/500	18	560/5	xxx
Cobalt	8000	9.0	80	xxx
Copper	2500	20	25	xxx
Lead	1000	8.1	5	xxx
Mercury	20	<0.10	0.2	xxx
Molybdenum	3500	<10	350	xxx
Nickel	2000	16	20	xxx
Selenium	100	<5	1	xxx
Silver	500	<2	5	xxx
Thallium	700	<50	7	xxx
Vanadium	2400	33	24	xxx
Zinc	5000	46	250	xxx

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

PREPARED BY

JB

APPROVED BY

Paul

C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: SP 20-D-0

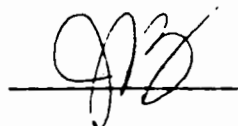
CAL ID: 26748-2

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	xxx
Antimony	500	<40	15	xxx
Barium	10000	68	100	xxx
Beryllium	75	<0.5	0.75	xxx
Cadmium	100	0.58	1	xxx
*Chromium III/VI	2500/500	9.7	560/5	xxx
Cobalt	8000	3.9	80	xxx
Copper	2500	13	25	xxx
Lead	1000	48	5	xxx
Mercury	20	<0.10	0.2	xxx
Molybdenum	3500	<10	350	xxx
Nickel	2000	9.9	20	xxx
Selenium	100	<5	1	xxx
Silver	500	<2	5	xxx
Thallium	700	<50	7	xxx
Vanadium	2400	18	24	xxx
Zinc	5000	184	250	xxx

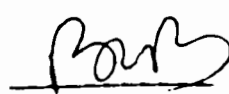
*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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C.A.M. METALS
California Title 22 Protocol
Data Sheet

SAMPLE ID: SP 21-C-0

CAL ID: 26748-3

	Total (TTLC) Regulatory Values (mg/Kg wet wt.)	Total Found (mg/Kg)	Leachable (STLC) Regulatory Values (mg/L in leachate)	Leachable Found (mg/L)
Arsenic	500	<40	5	xxx
Antimony	500	<40	15	xxx
Barium	10000	180	100	xxx
Beryllium	75	0.53	0.75	xxx
Cadmium	100	<0.5	1	xxx
*Chromium III/VI	2500/500	27	560/5	xxx
Cobalt	8000	11	80	xxx
Copper	2500	28	25	xxx
Lead	1000	138	5	xxx
Mercury	20	<0.10	0.2	xxx
Molybdenum	3500	<10	350	xxx
Nickel	2000	21	20	xxx
Selenium	100	<5	1	xxx
Silver	500	<2	5	xxx
Thallium	700	<50	7	xxx
Vanadium	2400	45	24	xxx
Zinc	5000	105	250	xxx

*Reported as Cr III plus Cr VI.

The less-than (<) symbol means "not present at or above the indicated value (detection limit)".

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